



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

[Handwritten signature]

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/521,260	01/13/2005	Adrian W. Payne	GB 020115	9017
24737	7590	03/21/2007	EXAMINER	
PHILIPS INTELLECTUAL PROPERTY & STANDARDS			PERILLA, JASON M	
P.O. BOX 3001			ART UNIT	PAPER NUMBER
BRIARCLIFF MANOR, NY 10510			2611	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/21/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)
	10/521,260	PAYNE ET AL.
	Examiner	Art Unit
	Jason M. Perilla	2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 13 January 2005.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-11 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 13 January 2005 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-11 are pending in the instant application.

Drawings

2. The drawings are objected to under 37 CFR § 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, "normalizing" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR § 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR § 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claim 7 and 8 are objected to because of the following informalities:

Regarding claim 7, “the number of stages” and “the over-sampling ratio” are each lacking antecedent basis.

Regarding claim 8, the claim is objected to for the same reasons as applied to claim 7 above.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 4, 5, and 7-10 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 4, the claim is rejected because one skilled in the art is unable to determine a definite meaning for “substantial” unity, and it makes the claim indefinite.

Regarding claim 5, the claim is rejected as being based upon a rejected parent claim.

Regarding claim 7, the claim is rejected because outputs “in the vicinity of” stages $N/2$ and $3N/2$ can not be definitely determined by one having ordinary skill in the art. No provision for how many stages “in the vicinity of” is made, and one skilled in the art is unable to make any such determination which is definite. *Furthermore, the number of stages, N, should be “relating to” the over-sampling ratio rather than a strict correspondence with it to properly embody the invention.*

Regarding claim 8, the claim is rejected for the same reasons as applied to claim 7 above.

Regarding claims 9 and 10, the claims are rejected as being based upon a rejected parent claim.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-3, 6, 7, and 11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Turner (U.S. Pat. No. 5561687) in view of Wang et al (U.S. Pat. No. 5489762; hereafter "Wang"), and in further view of Horvat et al (U.S. Pat. No. 6914946; hereafter "Horvat").

Regarding claim 1, Turner discloses a method of determining the values of data bits from a digitally modulated signal (abstract; figure 3), comprising over-sampling raw data (col. 5, lines 8-12) recovered from the demodulated signal (fig. 3, "INPUT: SIGNAL + NOISE"), delaying samples of the raw data (fig. 3, ref. 12), combining selected delayed samples of the raw data (fig. 3, ref. 14) to form a sample to be bit sliced (fig. 3, output of summer 14), bit slicing the samples (fig. 3, ref. 18) to be sliced to produce a bit stream signal (fig. 3, ref. 17), and delaying the bit stream signal (fig. 3, ref. 21). Turner discloses the receipt of digital data (col. 1, lines 10-20) but does not explicitly disclose the type of digitally modulated signal which is to be received by the receiver illustrated in

figure 3 and does not disclose that it is a frequency shift keyed signal (FSK). However, the receipt of FSK signals is notoriously known in the art as referenced by Wang. Wang discloses a strictly analogous slicer/receiver which receives FSK modulated signals (col. 1, lines 10-20). Therefore, it would have been obvious to one having ordinary skill in the art that the receiver of Turner could be tailored to receive signals being modulated via, among others, the FSK modulation technique because as suggested and referenced by Wang because it is a well known and exemplary method of modulating digital data.

Further regarding claim 1, Turner does not disclose using the bit stream signal to recover a clock signal, and using the recovered clock signal to sample the delayed bit stream signal at the data rate to produce detected bits. However, the use of a received signal to recover a clock signal is well known in the art as taught by Horvat. Horvat discloses a clock recovery circuit (fig. 7, ref. 507) which recovers a clock frequency of a sliced (fig. 7, ref. 506) signal and uses the recovered clock to sample (fig. 7, ref. 508) a bit stream. In the combination of Turner in view of Horvat, the recovery of the clock signal and sampling of the bit stream could be arbitrarily performed either before or after the delay of the bit stream with identical results as understood by one having ordinary skill in the art. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made that the recovered bit stream (either before or after the delay) of Turner could be utilized to recover a clock signal associated with the bit stream and sample the bit stream (either before or after the delay) to produce detected bits as taught by Horvat because the recovery of a clock signal is

Art Unit: 2611

advantageous to sample the received bit stream at the appropriate moment for the correct receipt of data.

Regarding claim 2, Turner in view of Wang, and in further view of Horvat disclose the limitations of claim 1 as applied above. Turner in view of Wang, and in further view of Horvat disclose combining samples of delayed raw data over several bit periods (fig. 7, ref. 12) because the delay of Turner contains oversampled data associated with a plurality of bits (col. 5, liens 8-15). Furthermore, all of the samples are combined as illustrated in figure 7. Therefore, Turner discloses, at least, combining samples occurring after delays of substantially half a bit period and one and a half bit periods.

Regarding claim 3, Turner in view of Wang, and in further view of Horvat disclose the limitations of claim 1 as applied above. Further, Turner discloses multiplying (fig. 7, ref. 113) raw data before combining it and the claimed particular combination of samples as applied to claim 2 above.

Regarding claim 6, Turner in view of Wang, and in further view of Horvat disclose the limitations of the claim as applied to claim 1 above.

Regarding claim 7, Turner in view of Wang, and in further view of Horvat disclose the limitations of claim 6 as applied above. The delay means of Turner comprises a shift register (fig. 7, ref. 112). Further, it is obvious and implied that the number of stages in the delay line of Turner (fig. 7, ref. 112) would correspond to the oversampling ratio of the received signal because there would be no purpose to oversampling the received signal if it were not able to be stored in the delay line for combining by the combining means (fig. 7, ref. 114). Therefore, the delay means

comprises a shift register having stages which "correspond" to the over-sampling ratio.

Finally, all of the stages of the shift register are applied to the combining means as illustrated.

Regarding claim 11, Turner in view of Wang, and in further view of Horvat disclose the limitations of claim 6 as applied above. Turner in view of Wang, and in further view of Horvat do not explicitly disclose that the second delay means comprises first and second delay stages, each having a delay of substantially one bit period, in that the bit slicing means has means for storing a plurality of threshold values, and means for selecting a threshold value for comparison with the currently held samples to be sliced in dependence on the bit values at outputs of the first and second delay stages. However, Wang teaches a delay means (fig. 6, refs. 630, 640) comprising first (630) and second (640) delay stages, each having a delay of substantially one bit period (T), in that the bit slicing means has means for storing a plurality of threshold values (fig. 6, ref. 650), and means for selecting (fig. 6, ref. 650) a threshold value for comparison (fig. 6, ref. 620) with the currently held samples to be sliced in dependence on the bit values at outputs of the first and second delay stages (fig. 7). Wang teaches an exemplary adaptive threshold slicing receiver wherein the threshold for slicing may be updated by the last sliced data values. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made that an adaptive threshold for slicing could be utilized to account for the changing levels of the received signal as taught by Wang in the method of Turner in view of Wang, and in further view of Horvat because it would assist in the determination of correct symbol decisions.

Art Unit: 2611

8. Claim 4 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Turner in view of Wang, in further view of Horvat, and in further view of Wagner (U.S. Pat. No. 4291286).

Regarding claim 4, Turner in view of Wang, and in further view of Horvat disclose the limitations of claim 3 as applied above. Turner in view of Wang, and in further view of Horvat do not explicitly disclose that the gain factor(s) (col. 9, lines 35-45) have a gain value of substantially unity. However, the chosen value of a gain factor in an equalizer, integrator, or digital filter is well understood in the art to be function of the design requirements of the system. The use of a gain factor of substantially unity is specifically well known in the art because only slight modifications are typically desired and such is disclosed by Wagner (col. 9, line 30; "each tap weight is unity"). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made that using a gain factor of substantially unity in the method of Turner in view of Wang, and in further view of Horvat would be desired depending upon the characteristics of the system and as suggested by Wagner because, as understood by one having ordinary skill in the art, only slight modifications to the raw data are desirable.

9. Claim 5 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Turner in view of Wang, in further view of Horvat, and in further view of Cheng et al (U.S. Pat. No. 5400368; hereafter "Cheng").

Regarding claim 5, Turner in view of Wang, and in further view of Horvat disclose the limitations of claim 1 as applied above. Turner in view of Wang, and in further view

of Horvat do not disclose normalizing the sample to be sliced prior to bit slicing. However, Cheng teaches normalizing received and digitized samples (fig. 7, ref. 96; col. 6, lines 45-55). Normalizing a received digitized signals is advantageous because it accounts for wide variations in the amplitude of a received signal. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to normalize a received and digitized signal as taught by Cheng in the method of Turner in view of Wang, and in further view of Horvat because it compensates for variations in amplitude which produce demodulation errors.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following prior art of record not relied upon above is cited to further show the state of the art with respect to digital receivers.

U.S. Pub. No. 2002/0067784 to Bowler.

U.S. Pat. No. 6115726 to Ignjatovic.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Perilla whose telephone number is (571) 272-3055. The examiner can normally be reached on M-F 8-5 EST.

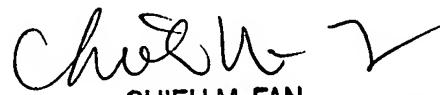
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Jason M. Perilla
March 9, 2007

jmp



CHIEH M. FAN
SUPERVISORY PATENT EXAMINER